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The seal of The Patent Office, London, featuring a central shield with a crown on top, flanked by two lions, and the words 'THE PATENT OFFICE' and 'LONDON' around the border.

Scrim having a twill weave has been found ideal for the purposes of this invention although a plain weave is also satisfactory. A twill weave is not as inflexible in the plane of the fabric as a plain weave scrim because at the points where two or more warp yarns cross over weft yarns and vice-versa there is more freedom of movement of the yarns and

consequently more flexibility and conformability. The plain or twill weave scrim can be constructed from spun yarns, monofilament or multifilament yarn or combinations of both and yarns can consist of any of the fibres referred to as textile fibres, e.g. polyamide cotton, wool, polyester, or acrylic. The term scrim as used herein is intended to include spunbonded scrim.

The preferred construction of the neededweb is an all cross-laid fibre construction, by which we mean the fibre direction in relation to the direction of fabric manufacture. The cross-laid fibre construction was found to give more desirable results on test than a straight and cross lay construction or an all straight-lay fibre construction.

A comparison of properties using different scrims and a nylon/wool fibre blend with that of Melton cloth, which also consists of a nylon/wool surface fibre blend, is set out in Table I. The area weights and thicknesses of the materials listed in Table I are identical for the purposes of this comparison.

TABLE I

Property	Melton	Twill Scrim (cotton)	Plain Scrim (nylon)	Spunbonded scrim (nylon)
Bending Length mms	88	100	104	106
% Extension on the bias (@ 1kg/cm load)	22.5%	18.0%	13.0%	12.0%
Extension Recovery (10% stretch)				
Bias	9.5%	8.0%	7.3%	5.1%
Warp	10.0%	7.0%	6.0%	4.0%
Weft	9.5%	8.0%	7.4%	4.7%

The bending length is a measure of the stiffness and pliability of the material and represents the minimum length required to project over a set edge to the point where that material forms an angle of 45° with the horizontal. The lower the bending length, the more pliable or less stiff the material. The extension on the bias is a measure of the ease by which the material can be stretched along and across the axis of the dumbell and a higher extension will allow the material to be moulded to the ball core easier than a material with a lower extension. Coupled with this property however is a measure of the extension recovery; a material that does not recover will easily be pulled permanently out of shape. As well as a high extensibility, the material must possess the ability to recover more than 75% of the stretch applied to the material.

The fibrous web is preferably composed of up to 50% wool blended with either acrylic fibres, viscose rayon fibres or acrylic fibres with a proportion of nylon or viscose fibres depending on the type of tennis court playing surface. By acrylic fibres we include fibres known as modacrylics, acrylics and polyacrylonitriles. These fibrous blends possess resilience and abrasion properties which allows the felt to wear "hairy", i.e. it retains the aerodynamic properties by not wearing smooth, does not produce pills as do most synthetic blends and does not form rat-tails in damp playing conditions. By rat-tails we mean an accumulation of several fibres wrapped around and intertwined which forms the appearance of a rat's tail.

A further advantage of these blends is that a low temporary thickness can be achieved by decatizing and damp calendering. A low temporary thickness allows balls to be made up which will fit into the moulds and not give rise to mould seam lines around the ball. Both viscose rayon and acrylic fibres lose their resilience under damp heat and pressure. The required nominal thickness of the cover material is recovered later in the tennis ball manufacturing process. In particular it has been found preferable although not always necessary to use fibre deniers between 6 dtex and 13 dtex, and fibre staple lengths of between 55 and 80 mm for the man made or synthetic fibres in the blend. With fibres of the aforementioned blends, deniers below 6 dtex tend to wear smooth and produce pills, and deniers above 13 dtex produce too coarse a handle and rat-tails in damp conditions. Staple lengths below 55 mm were found to give insufficient fibre anchorage and although the aerodynamic properties of the ball are not affected initially, the playable life of the ball is reduced because of the poor wear properties. Staple length above 80 mms gave an increased incidence of rat-tailing in both dry and wet conditions of play.

By way of example a for use in the invention was constructed from a plain cotton scrim, a fibre blend of 40% wool (nominally 35 microns) 60% acrylic fibre (9 den. 63 mm Courtelle)

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